

SRI International

Monthly Status Report • April 2011
Covering the Period 1 April through 30 April 2011

POWER MEMS DEVELOPMENT

Contract N00014-09-C-0252

Submitted in accordance with Deliverable A001 - Monthly Technical and Financial
SRI Project P19063

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MICROELECTROMECHANICAL SYSTEMS (MEMS) RESETTABLE CIRCUIT BREAKER (TASK 1.1) AND MEMS SWITCH FOR DC-DC VOLTAGE CONVERTERS (TASK 1.2)

Task 1.1 Contributors: Sunny Kedia, Weidong Wang, Susana Stillwell

Task 1.1 Deliverable: 10 prototype packaged MEMS-based resettable circuit breakers for testing and analysis in the Office of Naval Research (ONR) laboratories.

Task 1.2 Contributors: Sunny Kedia, Christel Munoz, Weidong Wang, Scott Samson, Drew Hanser

Task 1.2 Deliverable: Functional MEMS-based DC-DC converter in a vacuum package.

Summary:

This month, we continued fabrication of the Version 3.1 switches on three glass wafers. The fabrication was unsuccessful due to delamination of the sacrificial polymer, which occurred during deposition of the oxynitride structure layer. To address this and other fabrication issues, we redesigned the switch layout that included larger anchor points, gusseted spring connections, switch variations with 2x and 3x increases in the electrostatic electrode size, and a new chip with bench-style circuit-breaker switches. Next month we will fabricate and test the new design, Version 3.2.

DIAMOND HEAT SPREADER OR HEAT SINK FOR HIGH-POWER MEMS SWITCH APPLICATIONS (TASK 1.3)

Contributors: Priscila Spagnol, Shinzo Onishi, Drew Hanser, Weidong Wang, Sunny Kedia, John Bumgarner

Deliverable: Prototype device fabricated on a thin-film diamond heat spreader layer and individual samples of diamond on Si or other suitable substrates for material evaluation.

Summary: No work was done this month on Task 1.3.

POSITRON TRAPPING AND STORAGE (TASK 2)

Contributors: Ashish Chaudhary, Friso van Amerom, Tim Short

Deliverable: A minimum of four MEMS-based trap structures for radio frequency (RF) trapping of electrons.

Summary: No work was done this month on Task 2.

FINANCIAL STATUS

R&D Status Report

Program Financial Status

15 July 2009 through 30 April 2011

Contract Item No.	Current Funding	Current Period Expenses	Cumulative Expenses	% Budget Complete
0001	\$1,829,849	\$231,059	\$1,861,306	102%
Project Commitments		(207,587)	674	
Total	\$1,829,849	\$23,472	\$1,861,980	

Based on currently authorized work:

Is current funding sufficient for the current fiscal year (FY)? (Explain if NO) **Yes**

What is the next FY funding requirement at current anticipated levels **N/A (base fully funded)**